WT 09-176

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)
	)
NUCLEAR ENERGY INSTITUTE	)
and	)
UTILITIES TELECOM COUNCIL	)
	)
Request for Waiver to Permit	)
The Use of Two-Way Wireless Headsets and	)
Intercom Devices Inside Nuclear Power Plants –	)
Expedited Action Requested	)

To: Acting Chief, Wireless Telecommunications Bureau

PETITION FOR WAIVER
(Expedited Action Requested)

Ellen C. Ginsberg
Vice President and General Counsel
Nuclear Energy Institute
1776 Eye Street, N.W.
Washington, DC 20006-2946
Tel: (202) 739-8140
Fax: (202) 785-1895
Email:ecg@nei.org

Jill M. Lyon
Vice President and General Counsel
Utilities Telecom Council
1901 Pennsylvania Avenue, N.W.
Fifth Floor
Washington, DC 20006
Tel: (202) 872-0030
Fax: (202) 872-1331
Email: jill.lyon@utc.org

Dated: July 15, 2009

TABLE OF CONTENTS

SUMMARY

The Nuclear Energy Institute ("NEI") and the Utilities Telecom Council ("UTC), on behalf of the nuclear energy industry, seek a waiver of Parts 2 and 90 of the FCC's Rules in order to permit commercial nuclear power plants to obtain licenses under Part 90 in order to continue to use certain intercom and headset equipment, certified for use under Subpart H of Part 74, for indoor communications (the "Two-Way Wireless Headsets").[1] This request is based upon the unique physical structure of nuclear plants, decades of experience regarding the communications needs within those structures, and the strict safety standards and regulatory requirements imposed on nuclear power plants by the Nuclear Regulatory Commission ("NRC").

Grant of the Waiver is in the public interest because, as detailed herein, the Two-Way Wireless Headsets continue to be the only communications equipment that possess all of the requisite performance features upon which the plants have come to rely to protect nuclear workers, consistent with Nuclear Regulatory Commission ("NRC") regulation limiting worker exposure to radiation, and to promote safe plant operations. Further, there has been no evidence that the plants' use of the Two-Way Wireless Headsets has caused *any* interference to other licensees during the past five (5) years, thus demonstrating that the underlying purpose of the rules would not be compromised by a grant of the relief requested. Further, a recent study confirmed that Two-Way Wireless Headsets, operating indoors at 50 to 100mW, will have no effective signal beyond 500 feet to 1,000 feet outside of the plant building. These facts dramatically reduce the potential for any

[1] The Intercom Headsets are manufactured by Telex Communications, Inc., a division of The Bosch Group. The Intercom Headsets and the associated back-packs and base stations usually operate at 150.0-150.8MHz; 150.8-157.0375MHz; 157.0075-157.2175MHz; 157.1875-162.0125MHz; 162.0125-173.200MHz; 173.200-173.400MHz; 173.400-174.00MHz; 174.00-216.00MHz; 470.00-608.00MHz; 614.00-806.00MHz; and 796.00-868.00 MHz transmitting at just 50mW – 100mW, and offering transmitter RF Frequency stability at 0.005% and Transmitter Deviation at 40KHz.

interference to any other licensed users. Accordingly, strict application of the Commission's rules would indeed be inequitable, unduly burdensome and contrary to public interest.

None of these facts were "of record" when, in 2003, Telex Communications, Inc. ("Telex") sought a waiver that would allow its equipment to be used by the plants, which generally are Part 90 Business/Industrial eligible entities. As detailed herein, following five (5) years of industry surveys, manufacturer evaluations, and reports to the FCC, the record is clear: there is neither an equipment alternative nor a frequency choice that can as efficiently enable plant personnel to successfully fulfill their mission of protecting nuclear workers, thereby complying with the NRC rules, and also promoting safe plant operations.

Furthermore, because of the unique operational requirements associated with use of the Two-Way Wireless Headsets at nuclear power plants, waiver relief can be narrowly tailored such that it applies only to Power Licensees (defined pursuant to Section 90.7 of the FCC's Rules), operating on the frequencies currently used by the plants under their FCC experimental licenses, on specific plant property, and *inside plant buildings only.* Petitioners believe that these conditions, discussed in greater detail herein, will effectively limit the relief requested herein only to nuclear power plants, and will thereby ensure that the Two-Way Wireless Headsets are used in a manner that will pose no threat of interference to other licensed users.

Finally, grant of the requested relief also will remove the growing concern surrounding the plants' ongoing right to use the Two-Way Wireless Headsets, and will enable operators to plan their outage communications functions in advance, with regulatory certainty. Ample Commission precedent exists to support the grant of this waiver of the FCC Rules. Accordingly, as set forth more fully herein, good cause exists for grant of a waiver, in order to allow the nuclear plants to continue to use the Two-Way Wireless Headsets indoors for critical operations.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)
	)
NUCLEAR ENERGY INSTITUTE	)
and	)
UTILITIES TELECOM COUNCIL	)
	)
Request for Waiver to Permit	)
The Use of Two-Way Wireless Headsets and	)
Intercom Devices Inside Nuclear Power Plants –	)
Expedited Action Requested	)

To: Acting Chief, Wireless Telecommunications Bureau

PETITION FOR WAIVER

In accordance with the Commission's Rules,[1] the Nuclear Energy Institute ("NEI") and Utilities Telecom Council ("UTC") (collectively, the "Petitioners"), on behalf of Nuclear Regulatory Commission ("NRC")-licensed operators ("NRC licensees") of commercial nuclear power plants in the United States (the "plants"), hereby request expedited treatment of the waiver of Parts 2 and 90 of the FCC's Rules in order to be authorized to continue to use certain intercom and headset equipment, certified for use under Subpart H of Part 74, for indoor communications (the "Two-Way Wireless Headsets") (the "Waiver").[2]

[1] 47 C.F.R. §§ 1.3 and 1.925(b)(3).

[2] 47 C.F.R. Parts 2 and 90, and § 1.925(b)(4). Given the fact that the plants' current experimental licenses expire on February 19, 2010 – just seven (7) months from now -- Petitioners respectfully request that the Wireless Telecommunications Bureau accord this matter expedited treatment. Specifically, in order that the necessary plant outage and worker protection planning may be undertaken, Petitioners ask that the Bureau grant this Waiver no later than October 1, 2009.

Petitioners submit that good cause exists to grant the instant Waiver because the underlying purpose of the relevant rules would not be served by application to this situation and because there are unique and unusual factual circumstances presented herein that demonstrate that Petitioners have no reasonable alternative to the Two-Way Wireless Headsets. Specifically, five (5) years of extensive research, equipment industry surveys and reports to the FCC have made it clear that there is neither an equipment nor frequency alternative currently available that would provide the level of communications capabilities delivered by the Two-Way Wireless Headsets. Also, as more fully described herein, the Two-Way Wireless Headsets contribute substantially to the reduction in plant workers' exposure to radiation, consistent with NRC regulations, and to safe plant operation.

Moreover, there have been no reported incidents of interference during the entire five (5) year period the plants have used the Two-Way Wireless Headsets, both indoors and outdoors. Finally, unique factors associated with the NRC licensees' use of the Two-Way Wireless Headsets allow for very narrowly tailored regulatory relief. Collectively, these unique and unusual factual circumstances fully justify Petitioners' request that the FCC grant the NRC licensees a waiver of Parts 2 and 90 of the FCC's Rules to enable continued use of the Two-Way Wireless Headsets.

I. Background on Petitioners

A. NEI is a not-for-profit 501(c)(6) corporation which is responsible for representing the commercial nuclear energy industry. NEI's members include all entities licensed by the NRC to operate the Nation's 104 nuclear plants, nuclear plant designers, major architectural and engineering firms, fuel fabrication facilites and other entities involved in various aspects of the nuclear energy industry. NEI is responsible for establishing broad, unified nuclear industry policy on generic matters affecting nuclear energy, including the regulatory aspects of operational and technical issues. NEI promotes the beneficial uses of nuclear energy and technologies in the United States and

around the world, develops policy on key legislative and regulatory issues, and serves as a unified industry voice before the U.S. Congress, Executive Branch agencies, federal regulators, and the courts.

B. UTC, also a non-profit corporation operating under Section 501(c)(6) has been the national representative on communications and information technology matters for the nation's electric, gas, water and steam utilities, and natural gas pipelines, since its formation in 1948. UTC's members provide public service and public safety-related services throughout the United States and its territories, as well as in Europe and elsewhere. UTC's approximately 600 core members range in size from large combination electric-gas-water utilities that serve millions of customers, to smaller, rural electric cooperatives and water districts that serve only a few thousand customers each. Among UTC's member companies are most of the owners and operators of the nuclear power generating facilities on whose behalf this Petition for Waiver is submitted.

II. Nuclear Power Is Critical To The Nation's Energy Supply

The supply of power in the United States is under strain. At times, supply in some areas can barely meet demand. The problem is likely to get worse before it gets better. Over the next ten years, the utility industry expects peak demand to increase by over 17%, while committed generating capacity is expected to increase by only 8.4%.[3] In a number of regions, capacity margins are expected to drop well below target levels.[4]

Against this backdrop, nuclear power plants are an exceedingly important source of power. There are currently 104 operating units at more than 60 nuclear sites in the United States. These

[3] See NERC, 2007 Long Term Reliability Assessment: The Reliability of Bulk Power Systems in North America 10 (Oct. 2007) (2007 NERC Assessment), available at http://www.nerc.com/~filez/rasre ports.html.

[4] Id. at 24.

plants generate approximately 20% of the nation's electricity[5] and therefore are included in the FCC's definition of the nation's critical infrastructure industries.[6] Along with coal and natural gas, nuclear energy is a foundational part of the nation's power supply.

Nuclear power is a particularly important source of generation because of its cost stability and output reliability. The supply and cost of nuclear power do not fluctuate significantly based on weather or climate conditions, fuel cost variability, or the vagaries of foreign suppliers. Nuclear plants are able to operate without interruption for extended periods, up to 24 months at a time. Because nuclear power can be so reliably generated, it helps supply the "baseload" of electricity that is required for the national electric power grid to function. Indeed, the stability of the grid depends on nuclear power.

Nuclear energy is also comparatively inexpensive. Nuclear plants are currently estimated to be the lowest-cost producers of baseload electricity.[7] The consistent availability of nuclear power at predictable prices also has a stabilizing effect on the electricity market as a whole.

Finally, nuclear power is increasingly cited as an important part of efforts to minimize adverse environmental impacts. The world faces serious threats from global climate change.[8] Many believe that climate change is caused in significant part by the emission of greenhouse gases, including carbon dioxide. Nuclear plants emit no such gases. For that reason, the United Nations Intergovernmental Panel on Climate Change, which recently shared the Nobel Peace Prize for its

---

[5] See Comments of the Nuclear Energy Institute, Comment ID 316bEFR.020.002, at 407. The comments cited in this brief are available at http://www.epa.gov/waterseienee/316b/phase2/ comments/author-ph2.pdf. The page citations provided are to this compilation of the comments.

[6] See 47 C.F.R.§ 90.7, "*Critical Infrastructure Industries.*"

[7] See *Status and Outlook for Nuclear Energy in the United States* 3-4 (Aug. 2006), *available at* http://www.nei.org/resourcesandstats/documentlibrary/reliableandaffordableenergy/reports/statusreportoutlook/

[8] See Massachusetts v. EPA, 127 S. Ct. 1438,1455 (2007).

work on global warming, listed "nuclear energy" as a "key" technology for mitigating greenhouse gas emissions—a technology, importantly, that is "currently commercially available."[9]

Accordingly, because the nuclear energy industry contributes to meeting the Nation's power supply requirements, and also to mitigating greenhouse gas emissions, it is in the public interest to provide the necessary regulatory basis to enable safe and efficient operations.

III. Nuclear Plant Configuration and Radiation Management

Nuclear power plants are large industrial facilities located on sites ranging in size from approximately 400 to 1,400 acres. Many are located in remote areas, far from population centers, broadcast facilities, studios or television towers. The nuclear reactor containment buildings and other plant buildings are clustered inside a secure area which is itself encircled by a perimeter security fence. There may be as much as several thousand feet between the two fences, though the distances vary.[10]

Within each plant, the reactor containment area is constructed with four-foot to six-foot thick concrete walls, reinforced with steel. The connected buildings (e.g., turbine building, fuel handling building, emergency diesel generator building, auxiliary building) are structurally fortified

---

[9] See *Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report* 17 (Nov. 16, 2007 draft), *available at* http://www.ipcc.ch/; see *also Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* 269 (Cambridge Univ. Press 2007), *available at* http://www.mnp.nl/ipcc/pages_media/AR4-chapters.html ("Total life-cycle [greenhouse gas] emissions per unit of electricity produced from nuclear power are . . . similar to those for renewable energy sources. Nuclear power is therefore an effective [greenhouse gas] mitigation option, especially through license extensions of existing plants enabling investments in retro-fitting and upgrading." (citations omitted)).

[10] This is an important consideration, given the fact that the Two-Way Wireless Headsets, operating indoors at 50 mW, will produce no effective signal beyond 500 feet – 1000 feet outside the plant building. See March 3, 2005 letter from Special System Services (SSS) to the FCC regarding a test SSS conducted on behalf of Exelon Generation Company at the Limerick Nuclear Plant, in Limerick, PA, attached as Attachment A hereto. While acknowledging that attenuation data will vary plant-to-plant, this test is representative of the likely average attenuation of the Two-Way Wireless Headsets signal at an average plant. See also September 9, 2005 Declaration by T. Fred Short, Electrical Engineer, Consultant to Exelon confirming his March 3, 2005 letter and stating that "the signal strength of Telex Equipment, operated at 50 mW of output power inside a training center (e.g. a building with walls less thick than the plants' containment vessel) would be reduced to one-quarter of its non-obstructed path strength as it passes through the building wall, to the outdoors...no further than 500 feet outside of the building," included as part of Attachment A hereto.

and their interiors filled with large pipes, assorted water and other storage tanks, various large scale pumps and heaters, hydraulic systems, generators, metal bridges, cranes and other heavy equipment necessary for electricity generation.

In order to appreciate the importance of the Two-Way Wireless Headsets to the nuclear energy industry, it is helpful to understand the unique role they play in limiting worker exposure and contributing to the plants' operational safety. The nuclear fission process inside a nuclear reactor creates radioactive material. Small amounts of this material leave the reactor and circulate through the plants' piping systems in the primary coolant. As a result, small metal particles in the primary coolant—from normal operation and wear of pumps, valves and pipes—also become radioactive. These particals are carried through piping systems and are deposited in, for example, pipes and valves, where they become possible sources of radiation exposure for plant workers.

Workers perform various maintenance and other tasks in "radiation areas," the definition of which is an area of the plant where an individual could receive a dose equivalent in excess of 0.005 rem (0.05 mSv) in one hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.[11] NRC regulations require that access to such areas be strictly controlled, and that workers be protected against ionizing radiation when in a radiation area.

One way the NRC and reactor licensees enhance worker safety is by ensuring doses are "as low as reasonably achievable," which is known by its acronym "ALARA." Specifically, the NRC's ALARA standard requires that plants make:

> "every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into

[11] See 10 C.F.R. § 20.1003.

> account the state of technology, the economics of improvements in relation to the benefits to the public health and safety, and other societal and socioeconomic considerations, in relation to the utilization of nuclear energy and licensed materials in the public interest."[12]

Although NRC regulations limit nuclear worker radiation doses to no more than five (5) rem in any year,[13] ALARA drives NRC licensees to limit that exposure even further. During the 1990s, under the ALARA standards and associated practices, workers on average received less than 10% of the maximum annual radiation dose allowed by the NRC.[14] Most occupational doses are received during outages, when workers are engaged in refueling activities and performing maintenance work on equipment such as primary coolant system pipes, pumps and valves.

Through training, adoption of best practices, use of protective clothing and equipment (e.g., electronic personal dosimeters ("EPD") which are more fully described below), guidance by expert health physics personnel, and internal and external exposure testing, the ALARA principle is embodied in every aspect of each plant's radiation protection program and has resulted in lower worker dose.[15] As described in greater detail in Section III, the Two-Way Wireless Headsets have been a critical component of the carefully assembled suite of equipment (along with video cameras, local area network ("LAN") access points and EPDs) employed to enable health physics personnel to remotely monitor and communicate with workers in radiation areas throughout the plants, so that critical plant operations can be completed as quickly and efficiently as possible, thereby achieving the ALARA objectives.

---

[12] 10 CFR § 20.1003 et seq.

[13] A rem is a measure of the amount of radiation dose that takes into account the potential effects on the human body.

[14] See http://www.nei.org.

[15] *Radiation Protection for Nuclear Power Plant Workers*, July 2000 at http://www.nei.org.

The simultaneous use by plant workers of both EPDs and the Two-Way Wireless Headsets is an excellent example of how specific equipment contributes to protecting workers' health and safety as well as promoting safe plant operations in the challenging environment of a nuclear plant. EPDs are wireless communications devices (worn on the chest between the shoulders and waist), usually operating on 2.4 GHz unlicensed frequencies, providing real-time radiation exposure data from plant workers via transmitters that send data to a central command center. EPDs do not interfere with other plant equipment because of the limited power of their transmitters and their operating frequencies, which are generally higher than those of other wireless devices operating within the plants. Since Two-Way Wireless Headsets operate on much lower frequencies (and thus with substantial separation from those of the EPDs), both pieces of equipment can operate simultaneously and in close proximity. This enables plant command centers to monitor EPD readings and to instruct workers instantly and clearly to reposition their bodies away from "hot" areas to the extent possible, thereby minimizing worker dose, consistent with the NRC's ALARA objective.

IV. Plants' Limited Use of Two-Way Wireless Headsets

A. Surveys Confirm Need for Two-Way Wireless Headsets.

In order to fully understand the extent to which the Two-Way Wireless Headsets contribute to the plants' ability to meet the NRC's ALARA standard, Petitioners undertook a comprehensive survey of their members to confirm the nature and context of the use of the Two-Way Wireless Headsets at the plants. Staff at virtually every plant surveyed noted the unique combination of performance features of the Two-Way Wireless Headsets as being extremely valuable to ensuring greater worker protection from exposure to radiation and safe plant operation. These features included: wireless operation; hands-free use; full-duplex communications among multiple users;

reliable signals, generally with no call drop; no background noise; no inadvertent actuation; uninterrupted voice transmission; ease of use; and durability ("Requisite Performance Features"). Also, numerous responses stressed the absolute necessity for wireless equipment, so that workers do not trip and equipment does not become tangled.

The Requisite Performance Features are most essential during an outage, which occurs every 18-24 months and generally lasts 37-40 days, during which one or more of the reactors at a given site are shut down. One of the main activities during an outage is the refueling of the nuclear reactor, accomplished by removing irradiated fuel ("used fuel"), replacing it with "fresh" or un-irradiated fuel and moving the used fuel to a fuel pool.

In addition, there are numerous other, critically important operations performed during outages with the assistance of the Two-Way Wireless Headsets, including turbine maintenance; overhauling various pumps, motors and valves; installing modifications; performing testing and inspections; cleaning and maintaining steam generators; and calibrating and repairing equipment (e.g., high pressure injection safety equipment) that cannot be accomplished while the plant is operating. In each of these major maintenance activities, remote communication among multiple workers is essential. Workers must work in confined spaces, often involving mobile equipment such as cranes, refueling bridges, and elevators. As noted in Section II, each of these tasks exposes plant workers to radiation. The goal, whether undertaken in the context of moving used fuel to storage facilities, or performing maintenance work on pipes, pumps and valves exposed to radiation, is to have the fewest workers involved in the efforts, for the shortest possible time. As more fully described below, the Requisite Performance Features, found uniquely in the Two-Way Wireless Headsets, contribute significantly to these objectives, and thus to plant compliance with the NRC's regulatory requirements.

Specifically, in the 2005 survey plant personnel reported that[16]:

- We need continuous communication between the workers and the control room and the Two-Way Wireless Headsets provide excellent hands-free operation, enables multi-user platforms, provides uninterrupted voice transmission and minimizes background noise;

- Radiological safety is enhanced with the ability to communicate with workers in the field while being able to view remote dose and dose rate information from a central monitoring station. The ability to communicate with the worker to reposition their body or to move to a different location saves personnel radiation exposure;

- The Two-Way Wireless Headsets employ design functionality and utilizes frequency spectrum that uniquely meets the essential performance criteria for plants by providing communications that are continuous, instantaneous, predictable and reliable; and

- Operator's Radiation Protection Unit has struggled with ineffective outage communications for many years and has investigated numerous systems and the Two-Way Wireless Headsets are superb in their ease of use, durability, coverage area, quality of communication and ease of set-up. No other system on the market can duplicate each of these assets of the Two-Way Wireless Headsets at this time.

(See Attachment B: a Summary of 2005 Survey Responses on Use of Two-Way Wireless Headsets and Deficiencies of Potential "Alternatives").

In 2008, after operating under the Commission's Special Temporary Authority and experimental licenses, Petitioners undertook a new study of the plants to evaluate any changes in communications technology practices, hoping to determine that one or more of the plants had found a suitable alternative to the Two-Way Wireless Headsets. Once again, the survey data was clear: although eleven (11) plants had tested five (5) new types of equipment (in addition to the 24 tested in 2005), none provided all of the Requisite Performance Features. Among the most consistent objections to the potential alternatives they tested were unacceptable voice quality,

[16] NEI obtained the responses from the plants with the understanding that the information would be treated confidentially. Accordingly, these quotes are not attributed to any specific plant.

coverage and capacity shortcomings, and interference with other wireless devices and networks which must operate simultaneously with the plants' communications equipment. Thus, the 2008 survey demonstrated that the plants continue to need the Two-Way Wireless Headsets for the most critical communications functions, especially those inside the plant buildings, in order to limit worker exposure to radiation and to maintain safe plant operations. (See Attachment C: a Summary of the 2008 Survey Responses on Use of the Two-Way Wireless Headsets and Deficiencies of Potential "Alternatives.").

B. The Two-Way Wireless Headsets Help Maintain Safe Plant Operation.

So much sensitive equipment must operate in such close quarters inside a nuclear plant that it is especially critical that NRC licensees have communications equipment that does not jeopardize safe and predictable plant operation. Indeed, a key objective for plant managers is to make sure that plant equipment does not trigger actuation of operating equipment. This can occur when critical equipment malfunctions due to spurious radio frequency interference ("RFI"), which can jeopardize safe plant operation. To further illustrate how important this is, and the extent to which NRC licensees go in order to avoid actuations, every plant has established a series of "radio-free zones" around the most sensitive equipment to prevent any radios from actuating that equipment.

In the two surveys, plant staff identified specific incidents of plant equipment actuating and clearly articulated the importance of having all of the Requisite Performance Features available in order to avoid such actuations. Specifically[17]:

- The "push-to-talk" function of a hand held radio (1 watt, walkie-talkie type), employed next to a diesel driven pump, caused the pump to over-speed and shut down.

[17] Id.

- Use of a trunked radio system "tripped" the central air compressor in the Service Air System, rendering it non-operational.
- Use of a 450 MHz radio caused the shutdown of several of a plant's critical monitoring systems.
- RFI adversely affected electrical switch gear and relays, including an incident where an emergency diesel generator was actuated by RFI, jeopardizing plant operations.
- Use of an 800 MHz handheld radio triggered a shutdown of a plant's chlorine transfer system.

C. Plants Use the Two-Way Wireless Headsets in Limited Contexts.

The survey responses, taken together, suggest that one-half of the plants use their Two-Way Wireless Headsets only during outages. However, during outages (which, as noted in Section III.A, occur every 18 to 24 months and last 37 to 40 days), use is generally 24/7. Those NRC licensees that also use their Two-Way Wireless Headsets for non-outage purposes report that they do so an average of five or six times per month, usually for limited periods of the day. The vast majority of plants use the Two-Way Wireless Headsets extensively within the reactor buildings. Only about one-quarter of the plants currently use the Two-Way Wireless Headsets outside. Petitioners emphasize that the relief requested herein is limited to indoor use only, and that plants seeking to use Two-Way Wireless Headsets outside will need to independently request an additional waiver based on their unique situations.

Thus, the plants rely on the Requisite Performance Features found in the Two-Way Wireless Headsets for numerous critical communications functions during several procedures, from moving used fuel to testing, calibrating, maintaining, repairing or replacing equipment during an outage. While use is heaviest during the outage periods, some ongoing operations and maintenance work on "hot spots" also require Two-Way Wireless Headsets to minimize worker radiation exposure and thus comply with the ALARA standards. However, even during the periods of maximum use, as

noted herein, the industry now has a five- (5) year record of no interference by plant users of the Two-Way Wireless Headsets (including both indoor and outdoor use) to other licensees' transmissions.

V. Petitioners' Efforts to Identify Equipment Available for Licensing Pursuant to FCC Regulations

Since 2003, the FCC has authorized use of Two-Way Wireless Headsets at nuclear plants, first via Special Temporary Authorizations ("STAs")[18] and currently under experimental licenses.[19] In this context, in addition to the two (2) industry surveys and numerous solicitations of equipment manufacturers noted above, NEI undertook a series of meetings with representatives of the FCC's Office of Engineering and Technology, the Mass Media and Wireless Telecommunications Bureaus, the Chairman's Office, and the Public Safety and Homeland Security Bureau. These discussions examined the unique circumstances associated with the nuclear plants' communications requirements and the mitigating factors associated with their use of the Two-Way Wireless Headsets. The mitigating factors include: (i) use in steel fortified, thick-walled concrete buildings, operating on large, often remote sites; (ii) transmitting at extremely low power – almost always 50-100 mW; (iii) signals attenuating to -110 to -114dBm as they pass through the walls of the plant buildings, resulting in no effective signal beyond 500 feet to 1,000 feet outside the plant building;[20] and (iv) a

---

[18] See 0135-EX-ST-2003, granted April 7, 2003; see also, 0169-EX-ST-2004, granted April 7, 2004; see also, 0547-EX-ST-2004, granted October 7, 2004.

[19] See 0127-EX-ST-2005, granted April 7, 2005; attached as Exhibit B. See also 0254-EX-RR-2008, 0249-EX-RR-2008, 0251-EX-RR-2008, 0262-EX-RR-2008, 0250-EX-RR-2008, 0261-EX-RR-2008, 0219-EX-RR-2008, 0215-EX-RR-2008, 0495-EX-PL-2008, 0499-EX-PL-2008, 0239-EX-RR-2008, 0238-EX-RR-2008, 0252-EX-RR-2008, 0253-EX-RR-2008, 0218-EX-RR-2008, 0257-EX-RR-2008, 0258-EX-RR-2008, 0259-EX-RR-2008, 0260-EX-RR-2008, 0246-EX-RR-2008, 0494-EX-PL-2008, 0216-EX-RR-2008, 0248-EX-RR-2008, 0226-EX-RR-2008, 0241-EX-RR-2008, 0221-EX-RR-2008, 0221-EX-RR-2008, 0227-EX-RR-2008, 0244-EX-RR-2008, 0222-EX-RR-2008, 0223-EX-RR-2008, 0224-EX-RR-2008, 0217-EX-RR-2008, and 0242-EX-RR-2008.

[20] See n 10, supra.

record of not causing any interference with other licensee's transmissions over the past five (5) years, during which the Two-Way Wireless Headsets were used for both indoor and outdoor operations.

As noted herein, since 2004, Petitioners and the plants have actively sought equipment options and have tested 29 potential alternatives. Every one has one or more material shortcomings, including multi-path interference; insufficient voice quality; inadequate capacity for multiple headsets in simultaneous use; and interference with the other wireless equipment (e.g., EPDs that measure worker radiation exposure); and inadequate coverage. None offered all of the Requisite Performance Features upon which the plants have come to rely.

All of this data has been submitted to the FCC during the course of the STA filings, the experimental license applications, and the reporting requirements associated with the experimental licenses under the Consensus Plan entered into with the Broadcast Industry (NAB, MSTV and SBE) in April 2007 (See ET Docket No. 05-345). Summaries of the 2005 and 2008 surveys of the plants' use of the Two-Way Wireless Headsets and their experience in testing 29 potential alternatives have been presented to various FCC Bureaus and are attached hereto as Attachment B and Attachment C, respectively.

Further, UTC has reached out to numerous equipment manufacturer members, large and small, some of whom initially thought that they could fairly easily adapt other equipment to the plants' needs. Ultimately these manufacturers determined that they did not have a ready solution and that they could not justify the research and development investment necessary to develop a solution. Petitioners do not expect this situation to change in the foreseeable future, further necessitating this Petition for Waiver.

Although in 2004 the FCC rejected the Telex waiver request, which sought similar relief to that requested herein, Telex provided no proof that (i) there were no Part 90 frequencies that could provide the critical communications services; (ii) there was no currently available Part 90 equipment that could work; and (iii) Telex could not adapt the Part 74 equipment, or develop new equipment, to provide the required communications over Part 90 frequencies.[21] The Commission's Order also stated that for several reasons, any such FCC regulatory relief should be granted directly to the NRC licensees, not to the equipment manufacturer.

Over the past five (5) years, Petitioners have developed a record that demonstrates that there is no currently available equipment designed to operate on Part 90 frequencies that offers all of the Requisite Performance Functions and that neither Telex nor any other manufacturer has Part 90-certifiable equipment. Further, as recommended in the FCC's 2004 Order, Petitioners ask that the waivers requested herein, as well as licenses under Part 90, be issued directly to the plants, consistent with the manner in which the FCC has issued the experimental licenses. A listing of the nuclear plants in the U.S. is attached as Attachment D.

Now, having demonstrated beyond any doubt the plants' continued need for the Two-Way Wireless Headsets, and that there are neither equipment nor frequency alternatives, Petitioners urge that it is both a practical and appropriate regulatory solution for the FCC to grant waivers to these NRC licensees so that they, as Part 90 eligibles, may continue to use the Two-Way Wireless Headsets for indoor operations.

[21] See Telex Communications, Inc., Order, 19 FCC Rcd 23169, 23171 (WTB PSCID 2004) ("Order").

VI. The FCC's Waiver Standards

The FCC may grant a Waiver if one of two standards is met: "1) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested Waiver would be in the public interest; or 2) in view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative."[22] The FCC may also use the general waiver "good cause" analysis.[23] For the reasons set out below, Petitioners maintain that a waiver is fully justified and that use of the Two-Way Wireless Headsets by plant personnel meets both of the Commission's waiver standards.

A. Granting Petitioners' Waiver is in the Public Interest Because the Underlying Purpose of FCC Parts 2 and 90 Would Not Be Served and Would Otherwise Be Frustrated By Application to the Nuclear Energy Industry.

Although nuclear power plants are eligible licensees under Part 90 of the FCC Rules, continued use by the plants of the Two-Way Wireless Headsets will require waivers of Parts 2 and 90. The underlying purpose of the Rules would not be served by limiting plants to use of frequencies normally available for licensing under Part 90. As demonstrated herein, use of the Two-Way Wireless Headsets serves an overriding public interest in reducing nuclear worker exposure and maintaining safe plant operations, and is the only acceptable communications choice for these purposes.

Neither the Petitioners nor any of the plants have received, or are aware of, any claims by other licensees that the plants' use of the Two-Way Wireless Headsets is causing, or has ever caused, any interference. Since other licensees have not experienced interference, and since the minimal

---

[22] 47 C.F.R. § 1.925(b)(3)(i)-(ii).

[23] 47 C.F.R. § 1.3.

potential for any future interference can be addressed by limiting use to indoor locations at the plants and by capping power levels, the underlying purpose of the frequency allocation rules is not served by strict enforcement in this case.

B. Unique Circumstances Compel a Grant of the Waiver.

There are numerous unique circumstances associated with Petitioners' request for a Waiver, each of which favors a grant of the requested relief; all of which fully justify such a result. First, as noted above, many plants operate in rural areas away from population centers, on sites of approximately 400-1,400 acres. Second, under a waiver, all future use of the Two-Way Wireless Headsets would occur within a building, typically within the containment comprised of four-foot to six-foot thick concrete and steel-reinforced walls designed to withstand earthquakes, tornadoes and other disasters. Third, most plants operate the Two-Way Wireless Headsets at 50 to 100 mW, meaning that there is no effective signal beyond 500 feet – 1000 feet outside the plant building.[24] Fourth, according to all of the information Petitioners have gathered, including discussions with FCC staff, there has never been a report that use of the Two-Way Wireless Headsets by a plant caused any interference to another licensed user. Petitioners contend that these unique circumstances make replication in another context extremely unlikely, further justifying grant of the requested relief.

C. Good Cause For Grant Exists; Strict Application of the Parts 2 and 90 Rules in this Limited Case Would be Contrary to the Public Interest.

Good cause exists for the grant of the Waiver. By using the Two-Way Wireless Headsets, plant operators reduce workers' exposure to radiation during outage operations, as well as during routine maintenance operations that must be conducted while the plant is on-line. If the plants were

[24] See n 10, supra.

required to discontinue use of the Two-Way Wireless Headsets as of February 19, 2010 (when the current experimental licenses expire), reducing radiation exposure to workers will be more challenging and the potential for incidents adversely affecting plant safety will be increased. It is easy to envision, for example, that if plants were forced to replace the Two-Way Wireless Headsets with a device that did not allow for reliable, hands-free, full-duplex communications capabilities, vital communications in and around the plant would take longer, and require more workers to perform tasks involving radiation exposure. If the plants were forced to turn to a technology that caused results as significant as spurious actuation, interference or equipment desensitization, these communication breakdowns could result in more safety-significant operational events and even unscheduled partial (or complete) plant shut-downs. Accordingly, strict application of the Parts 2 and 90 Rules would be counter to the regulatory scheme for workers and plant safety established by the NRC, the federal agency responsible for protecting public health and safety through oversight of nuclear power plants.

D. The Nuclear Power Industry's Communications Needs Are Not Met By Any Other Available Communications Equipment.

As noted above on several occasions, Petitioners also sought input from plant operators regarding other available communication technologies that could serve as an alternative to the Two-Way Wireless Headsets. Based on the responses from the plants, and based on UTC's knowledge of the plants' communications needs and the equipment available on the market today, Petitioners have concluded that there is no alternative equipment available that would provide all of the Requisite Performance Features needed by the NRC licensees.

As noted in Section III hereof, there are material shortcomings to each of the potential alternatives, including the interference with other wireless devices caused by unlicensed 2.4 GHz equipment; the poor voice quality and unreliability of Part 90 UHF equipment; and the lack of

multi-user functionality of commercial cell phone systems. Respondents also noted that wired solutions can result in additional dosages of radiation during wired cable installation and removal. Thus, none of the tested alternatives have all of the Requisite Performance Features.

The Two-Way Wireless Headsets are uniquely capable of overcoming the deficiencies found in the other equipment, principally because they operate on frequencies far from the spectrum employed for numerous other wireless devices that must be used in the plant, often simultaneously and in close proximity. Obviously, however, the same fact triggers the need for this Petition, given that the Two-Way Wireless Headsets are not designed to operate on Part 90 frequencies for which the plants are eligible. Petitioners believe that the best solution is to make this limited use, under restricted conditions, under the plants' general Part 90 eligibility, as requested herein.

In addition, the planning and implementation of nuclear fuel outages is complicated enough without the ongoing regulatory uncertainty of whether plants will have access to the Two-Way Wireless Headsets when needed. The plants seek regulatory stability through this Petition, which will enable them to plan outages and ensure appropriate radiation protection for workers carrying out maintenance operations.

E. Case Precedent Supports Petitioners' Waiver.

Recent Commission decisions support Petitioners' request for a Waiver. In Dominion Virginia Power,[25] the Wireless Telecommunications Bureau granted Dominion's request for a Waiver of the Commission's rules to allow Dominion to use frequencies allocated to the Part 90 Public Safety Pool, for which Dominion was not eligible to be licensed.[26] The Commission found Dominion's waiver request compelling, noting that the utility "will use the proposed frequencies at

[25] Dominion Virginia Power, Order, 19 FCC Rcd 12254 (2004).

[26] Id. at 12255.

two of its nuclear power plants to provide critical infrastructure communications."[27] The Commission also concluded that Dominion had demonstrated that "there are no reasonable alternatives within the existing rules to accommodate the described needs,"[28] by showing that "alternative communications are not feasible . . . particularly given the sensitive nature of the nuclear facilities it operates."[29] Like Dominion, the nuclear power plants have demonstrated that they have no reasonable alternative to achieve the critical infrastructure communication that is not only desirable, but required, by the NRC's regulatory regime.

In 2004, the Bureau granted a similar request from a nuclear facility, Entergy Nuclear Indian Point,[30] to access the Public Safety Pool for a land mobile system, finding that Entergy's use of requested frequencies would not interfere with incumbent users because of limited signal propagation, low (10 watts) Effective Radiated Power (ERP) and height of no more than 12 meters above ground. A key factor that led to the Commission's grant of Entergy's waiver request was that it "will not frustrate the underlying purpose" of the relevant Rule Section, which is to "ensure adequate spectrum for public safety activities, and to avoid interference to such communications from incompatible users."[31] This is precisely the case with the instant Petition: even lower ERP and resulting signal propagation, a demonstrated history of no interference to other users, as well as confined use to ensure continued non-interference.

---

[27] Id.

[28] Id. at 12256.

[29] Id.

[30] See Entergy Nuclear Indian Point 2, LLC, at 21259.

[31] Id. at 3. See also, New York Stock Exchange Inc., Order, 19 FCC Rcd 2602, 2604 (2004), (Commission waived the eligibility criteria "in light of the absence of any interference to any other user from NYSE's proposed use of the public safety frequencies . . . ").

In addition, the FCC has previously recognized the extent to which the nuclear power plants' unique and critical communications needs affect the "safety of life; health and property" by including the plants in the definition of entities that are included within the "public safety radio services" definition and therefore, exempt from having to obtain spectrum via FCC auction.[32]

Moreover, and in support of this Petition, Petitioners note that, in 1995, the Commission conditionally waived the Part 2 and 90 rules to allow New York City area public safety agencies to use television Channel 16 for a minimum of five years, after determining that such arrangement "could be concluded without affecting the existing television operations . . . ."[33] Nearly ten years later, in 2004, the Commission acknowledged that "Channel 16 has successfully coexisted with television operations"[34] and that "the public interest would be served by changing the temporary authorization to a permanent allocation."[35]

Petitioners seek neither a temporary authorization of frequency nor a permanent frequency reallocation; rather, Petitioners seek only a waiver of the Part 90 licensing rules so that the Two-Way Wireless Headsets may be used by operators of nuclear power plants, eligible for licensing under Part 90. Petitioners believe that this modest accommodation is well within the bounds of recent Commission action to address eligibility challenges in the context of demonstrable public interest. The fact that nuclear power plants are among the Nation's most critical infrastructure entities, for

---

[32] See Implementation of Sections 309(j) of the Communications Act of 1934, as Amended, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 22709 (2000) (interpreting Section 309(j)(2) of the Telecommunications Act).

[33] See Waiver of Parts 2 and 90 of the Commission's Rules to Permit New York Metropolitan Area Public Safety Agencies to Use Frequencies at 482-488 MHz on a Conditional Basis, 10 FCC Rcd 4466 (1995).

[34] Amendment of Parts 2, 73, 74 and 90 of the Commission's Rules to Permit New York City Metropolitan Area Public Safety Agencies to Use Frequencies at 482-488 MHz, Report and Order, 19 FCC Rcd 6719, 6728 (2004).

[35] Id.